

Solar Electricity



Without the sun, life as we know it would not exist. The light and heat radiated by the sun sustain plant and animal life on earth, providing the fuel for all of the planet's natural processes. Since humans walked the earth, we've used the sun in countless ways. In recent decades, we've discovered how to convert the sun's heat and light into clean, reliable sources of electricity.



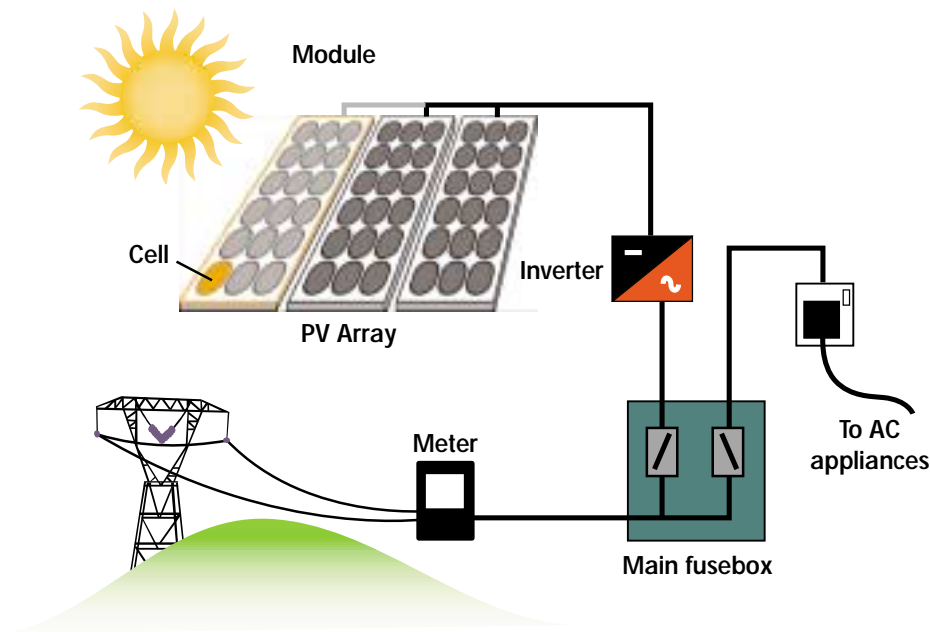
*RENEWABLE
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CALIFORNIA ENERGY COMMISSION

What is solar electricity?

Photovoltaics (PV), meaning "light electricity," is a diverse technology that converts the sun's light directly into electricity. Solar electricity powers homes, businesses, and spacecraft, and devices such as calculators, roadside emergency call boxes, and parking lot lighting systems.

Photovoltaic cells are small semiconductors manufactured from silicon and other conductive materials. When light strikes a PV cell, electrons from the cell's negative layer flow through a circuit to its positive layer, producing an electric current. Dozens of individual cells are arranged together to form a sealed, weatherproof module, with the capability to meet a wide variety of electrical needs, large and small. Modules can be grouped together into PV arrays, and wired



through an inverter that changes the direct current produced by PV modules into alternating current, making the electricity suitable for homes and business, and compatible with the electric grid.

PV modules operate best when oriented on a south-facing roof or slope, and given clear, unobstructed access to the sun for most of the day. After determining the electricity needs of the site, a good rule of thumb for determining the most suitable system size is that a square foot of single- or poly-crystalline PV module area produces ten watts of power in bright sunlight. When making a decision about system size, the system's efficiency in converting light to electricity should also be considered.

Why is solar electricity important?

Solar electricity production releases no pollutants or greenhouse gases into the atmosphere, and the sun's energy is an abundant and renewable resource. In fact, each hour of sunlight that reaches the earth contains potential energy greater than the amount of electricity used annually by every person on the planet. Harnessing solar power will be important for our energy future, providing energy diversity and reducing our dependence on fossil fuels.

Photovoltaic technology is also versatile. In space or on Earth, at sea or on land, PV can quietly produce electricity where it's needed. PV is cost effective in offsetting electricity that would otherwise be purchased from a utility, and in bringing electricity to areas too remote for a connection to an electric grid.

The future of solar electricity

The PV industry has grown along with the demand for clean, reliable alternatives to conventional energy sources. During the past few years, the efficiency of PV cells has increased tremendously. Currently, solar electricity accounts for about one percent of the electricity used in California. New cell materials are more reliable and efficient, offering the promise of continued improvements in the technology. These advancements will decrease the cost and shorten the time it takes for a PV system to pay for itself, expanding the use of PV in homes and businesses, and in utility-scale operations, and bringing affordable solar electricity to millions.

Harness the Power All Around Us

For more information on solar electricity and other renewable energy sources

www.consumerenergycenter.org



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